REMARKS

Claims 1-7, 12-41 and 60-98 are pending in this application. By this Amendment, new claims 60-98 are added. In addition, claims 8-11 and 42-59 are cancelled without prejudice to, or disclaimer of, the subject matter recited therein. Applicants reserve the right to file a divisional application to pursue the subject matter of non-elected claims 52-56. Support for the new claims can be found for example, on page 35, lines 6-26, page 39, lines 1-2, page 41, lines 4-5 and page 94, lines 19-24 of the specification. No new matter is added. Reconsideration and prompt allowance of the pending claims are respectfully requested at least in light of the following Remarks.

I. Allowable Subject Matter

Applicants thank the Examiner for the indication that claims 5, 6, 17-23, 25, 26 and 31-33 contain allowable subject matter. However, Applicants assert that all of the pending claims recite allowable subject matter.

II. §101 and §112 Rejections

The Office Action rejects claims 8 and 11 under 35 U.S.C. §112 and rejects claims 8 and 11 under 35 U.S.C. §101. The cancelation of claims 8 and 11 render the rejections moot. Applicants request withdrawal of the rejections.

III. The Claims Define Patentable Subject Matter

The Office Action rejects claims 1-4, 7, 8, 12, 13, 15, 24, 30, 34, 35, 38 and 39 under 35 U.S.C. §102(e) over U.S. Patent Application Publication No. 2004/0160582 to Lof et al. ("Lof"); rejects claim 38 under 35 U.S.C. §102(e) over U.S. Patent No. 6,809,794 to Sewell; rejects claims 9 and 11 under 35 U.S.C. §102(b) over U.S. Patent No. 5,610,683 to Takahashi; rejects claims 1-4, 7, 8, 12-15, 24, 27-30, 34, 35, 37-51 and 57-59 under 35 U.S.C. §103(a) over U.S. Patent No. 6,882,406 to Kurt et al. ("Kurt") in view of Lof; rejects claims 10, 16 and 36 under 35 U.S.C. §103(a) over Takahashi in view of Lof; and rejects

claims 1-4, 7, 8, 12, 15, 24, 30, 34, 35, 38 and 39 under 35 U.S.C. §103(a) over PCT Publication No. WO2004/053955 ('955) in view Lof. The cancelation of claims 8-11, 42-51 and 57-59 render the rejections of those claims moot. The rejections of the remaining claims are respectfully traversed.

A. Rejection Over Lof

Claim 1 is patentable over Lof because Lof fails to disclose each and every feature of claim 1. For example, Lof fails to disclose "a member, at least a part of a surface of which is liquid-repellent, is provided exchangeably on the substrate table," as recited in claim 1. The Office Action asserts that layer 60 corresponds to the member of claim 1. Applicants disagree with this assertion.

Lof discloses an exposure apparatus that includes an edge seal 17 situated on a substrate table WT to prevent catastrophic loss of immersion liquid (see Lof, Fig. 3 and paragraph [0113]). Lof further discloses that layer 60 is located on the substrate table WT and below a substrate W and that an edge seal 117 is situated on the substrate table WT (see Lof, Fig. 11 and paragraph [0157]). The edge seal 117 of Lof can be replaced with removable edge seal 17 (see Lof, paragraph [0156]). The layer 60 of Lof has a material which is hydrophobic (see Lof, paragraph [0157]).

However, Lof is silent regarding whether layer 60 is removable. In fact, it appears that layer 60 of Lof is not removable. For example, in an alternate embodiment, Lof discloses a flexible further edge seal member 500 that assists edge seal 17 to prevent the liquid from leaking, which is similar to the function of layer 60 (see Lof, paragraph [0148] and Fig. 8a). Further edge seal member 500 is permanently affixed to the substrate table WT (see Lof, paragraph [0148] and Fig. 8a). Because further edge seal member 500 is permanently affixed to the substrate table WT and performs a similar function as layer 60, it seems likely that Lof intends for layer 60 to be permanently affixed to the substrate table WT.

In yet another alternate embodiment, Lof discloses a pimple table 20 that can be decoupled from the liquid supply system between the substrate W and the edge seal member 117 (see Lof, paragraph [0156]). Lof further discloses positioning the layer 60 to repel liquid, which finds its way into the gap between the substrate W and the edge seal member 117 when the liquid supply system is positioned over the edge of the substrate, and form an effective seal to protect the pimple table 20 from the liquid (see Lof, paragraph [0157]). Lof is silent regarding how layer 60 is provided. However, it appears that layer 60 is integral to protecting the pimple table 20 from the liquid. Thus, if layer 60 were removed from the configuration, the seal protecting the pimple table 20 would be destroyed.

Claim 12 recites "a liquid-repellent member, at least a part of which is liquid-repellent, is provided on the movable stage, and the liquid-repellent member is exchangeable." Therefore, claim 12 is patentable over Lof at least for reasons similar to those discussed above for claim 1, as well as for the additional features claim 12 recites.

Claim 38 recites, "a part of the exposure apparatus, which is different from the substrate for which the liquid is supplied, is liquid-repellent, and the liquid-repellent part of the exposure apparatus is exchanged depending on deterioration of liquid repellence thereof." Therefore, claim 38 is patentable over Lof at least for reasons similar to those discussed above for claim 1. Furthermore, Lof fails to disclose that the liquid-repellant part of the exposure apparatus is exchanged depending on deterioration of the liquid repellance thereof as required in claim 38.

Dependent claims 2-4, 7, 13, 15, 24, 30, 34, 35 and 39 depend from independent claims 1, 12 and 38, respectively. Therefore, those dependent claims are patentable at least for their dependence from claims 1, 12 and 38 as well as for the additional features those dependent claims recite.

Withdrawal of the rejection is respectfully requested.

B. Rejection Over Sewell

Claim 38 is patentable over Sewell because Sewell fails to disclose each and every feature recited in claim 38. For example, Sewell fails to disclose "a part of the exposure apparatus, which is different from the substrate for which the liquid is supplied, is liquid-repellent, and the liquid-repellent part of the exposure apparatus is exchanged depending on deterioration of liquid repellence thereof," as recited in claim 38.

Sewell discloses a liquid immersion photolithography system with lens elements 102A and 102B mounted within a housing 103 (see Sewell, col. 3, lines 34-36). Sewell further discloses that the top of the housing 103 includes an opening 110 for projecting an image onto a wafer 101 and that the surfaces of the housing 103 can be made hydrophobic (see Sewell, col. 3, lines 36 and 37 and col. 4, lines 34-36). The Office Action asserts that the housing 103 could be exchanged when the liquid repellant deteriorates, but fails to point out where Sewell discloses this.

Applicants submit that Sewell fails to disclose this feature. Furthermore, it would seem unlikely that Sewell would disclose that housing 103 could be exchanged because lenses 102A and 102B are mounted on the housing 103, which would make such an exchange cumbersome (see Sewell, Fig. 1). Furthermore, Sewell fails to disclose that such an exchange would be made depending on the deterioration of liquid repellance of the housing as recited in claim 38. Therefore, claim 38 is patentable over Sewell.

Withdrawal of the rejection is requested.

C. Rejection Over Takahashi

The cancelation of claims 9 and 11 render the rejection over Takahashi moot.

D. Rejection Over the Combination of Kurt and Lof

Kurt and Lof either alone or in combination fail to disclose and would not have rendered obvious "a member, at least a part of a surface of which is liquid-repellent, is provided exchangeably on the substrate table," as recited in claim 1.

The Office Action agrees that Kurt fails to disclose the member of claim 1, but asserts that Lof remedies this deficiency. However, as discussed above for the §102(e) rejection over Lof, Lof also fails to disclose the member of claim 1. Therefore, even if combined, Kurt and Lof would not have rendered obvious the member of claim 1.

Furthermore, one of ordinary skill in the art would have no reason for combining Kurt and Lof because Kurt teaches away from the liquid immersion exposure method and apparatus of Lof. In particular, Kurt discloses an EUV lithography apparatus in which a reflectivity of optical elements can be reduced through oxidation of the top layer of the mirror and that oxidation of the surface of the mirror under EUV radiation may be caused by the presence of water (see Kurt, col. 3, lines 45-52). Kurt further discloses at least one optical element having a hydrophobic self-assembled monolayer to address this issue (see Kurt, lines 55-67). EUV exposure systems are adversely affected by liquids and do not operate in a liquid immersion environment. Therefore, combining Lof and Kurt would destroy the invention of Kurt.

In addition, Applicants disagree with the Office Action's assertion that the combination of Kurt and Lof disclose or would have rendered obvious Applicants' claimed optical elements. In particular, Kurt discloses an exposure apparatus that applies a hydrophobic self-assembled monolayer onto optical elements (see Kurt, col. 4, lines 1-4). The Office Action asserts that these optical elements substantially correspond to the optical elements recited in the claims. However, the Office Action notes that the optical elements disclosed in Kurt are not provided on the substrate table as required by the claims. The Office

Action asserts that Lof remedies this deficiency. However, Lof fails to disclose applying a hydrophobic layer onto any optical device. As discussed above for the 102(e) rejection over Lof, Lof merely discloses a layer 60 associated with an edge seal 117 to prevent leakage of the liquid. Layer 60 of Lof is not an optical element. Therefore, Lof fails to disclose an optical element provided on a substrate stage as required by the claims and fails to remedy the deficiency of Kurt.

Furthermore, neither Kurt nor Lof discloses that the optical elements include an adhesive particulate layer applied to a light irradiated surface of any optical part or that a water-repellent film is applied to an adhesive particulate layer as required by the claims. Therefore, even if Kurt and Lof were combined, they would still fail to disclose and would not have rendered obvious Applicants' claimed optical elements. each and every feature recited in the claims.

Claim 12 recites "a liquid-repellent member, at least a part of which is liquid-repellent, is provided on the movable stage, and the liquid-repellent member is exchangeable." In addition, claim 38 recites, "a part of the exposure apparatus, which is different from the substrate for which the liquid is supplied, is liquid-repellent, and the liquid-repellent part of the exposure apparatus is exchanged depending on deterioration of liquid repellence thereof." Therefore, claims 12 and 38 are patentable over Lof at least for reasons similar to those discussed above for claim 1, as well as for the additional features claims 12 and 38 recite.

Dependent claims 2-4, 7, 13-15, 24, 27-30, 34, 35 and 37-41 depend from independent claims1, 12 and 38, respectively. Therefore, those dependent claims are patentable at least for their dependence from claims 1, 12 and 38 as well as for the additional features those dependent claims recite.

Withdrawal of the rejection is respectfully requested.

E. Rejection Over the Combination of Takahashi and Lof

Dependent claims 16 and 36 depend from independent claim 12. Therefore, dependent claims 16 and 36 are patentable at least for their dependence from claim 12 as well as for the additional features claims 16 and 36 recite.

The cancelation of claim 10 renders the rejection of claim 10 moot.

Withdrawal of the rejection is requested.

F. Rejection Over the Combination of '955 and Lof

'955 does not qualify as prior art against Applicants' application. The publication date of '955 is June 24, 2004. However, Applicants' Application claims priority from JP 2003-404384. The December 3, 2003 filing date of JP 2003-404384 is earlier than the June 24, 2004 publication date of '955. A verified English translation of Applicants' priority application, which supports the subject claims, is attached to perfect priority.

Accordingly, the rejection should be withdrawn.

IV. New Claims

New claims 60-96 depend from independent claims 1, 12 and 38, respectively. Therefore, new claims 60-96 are patentable at least for their dependence from claims 1, 12 and 38 as well as for the additional features those claims recite.

New claim 97 recites "providing a member, at least a part of a surface of which is liquid-repellent, on a substrate table, the substrate table holding the substrate...exchanging the member after performing the liquid immersion exposure for the substrate." Therefore, claim 97 is patentable at least for reasons similar to those discussed above for claims 1, 12 and 38 as well as for the additional features claim 97 recites.

Claim 98 depends from independent claim 97. Therefore, claim 98 is patentable at least for its dependence from claim 97 as well as for the additional features claim 98 recites.

IV. Conclusion

In view of the foregoing, it is respectfully submitted that this application is in condition for allowance. Favorable reconsideration and prompt allowance of all pending claims are earnestly solicited.

Should the Examiner believe that anything further would be desirable in order to place this application in even better condition for allowance, the Examiner is invited to contact the undersigned at the telephone number set forth below.

Respectfully submitted,

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Attachments:
Verified English Translation of JP 2003-404384
Petition for Extension of Time
Amendment Transmittal

Date: May 21, 2010

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